SDH ADM/TM compact Multiplexer

Version 1.8—June 2010

HX9400S-1U SDH/SONET STM1/STM4

Features

- 1U , 19" , 23" rack mount
- TM, ADM, XC
- VC11/12/3/4 cross-connect
- SDH and SONET
- Aggregate Lines
  - Two Aggregate Lines
  - STM-4/1 or OC-12/3 (software configurable) Option
  - Pure STM-1 or OC-3 Option
  - Hot Swappable Aggregate Lines.
- Fixed Tributary modules (option):
  - One Base module and two extension modules (manufacturer's option)
  - 8/16-channel E1/DS1 on base module
  - 16 E1/T1 per extension module
  - 3 E3/DS3 per module
  - 4 FE EoS port on 2nd extension module
  - 1 GbE
  - 1GbE + 3 DE
- Protection:
  - SNCP/UPSR protection
  - MSP (1+1) protection for TM
  - Redundant hot-swappable DC power card
  - Rack mount, Wall mount, and Stand-Alone
- SDH NG over Ethernet : EoS
- External/Internal/Line timing with SSM
- Support VCAT, GFP, and LCAS for EoS
- Intelligent L2 Switch option for Ethernet module to support Ethernet lease line service and virtual LAN.
- Jumbo Frame supported
- VLAN transparent
- Link down transmission
- Performance monitoring
- Alarm suppression, masking, and report
- 4 alarms input and 4 output.
- Fully front access option ETSI
- Management:
  - Centralized management with CXR's EMS/NMS over DCC channel
  - VT100 menu-driven EMS

ADM & TM STM1/4 Multiplexer Economic & Compact

Mounted with 2 aggregate optical or electrical STM-1/4 interfaces, the HX9400-S is a compact and economic SDH/SONET ADM/TM of the CXR range. This device is provided with SNCP or MSP(1+1) protection in Ring or Termination topology, and it is used by the Telco/ISP to distribute Ethernet/Gigabit Ethernet or by all Transport and Utility infrastructures to deploy a 622Mbps backbone for legacy/TDM/analogue/Scada or for pure IP video/voice/data with a high level of protection.

All interfaces are fully compliant with the relevant ETSI standards and ITU recommendations. The HX9400-S ADM provides powerful Operation, Administration, Maintenance and Provisioning (OAM&P) functionality, including fault management, performance monitoring, configuration management, and network security management. Through the console port, LAN port, and DCC channel, the OAM&P can be achieved both locally and remotely via SNMP or menu-driven interfaces.

The HX9400-S deliver differents tributaries E1, T1, E3, DS3, FastEthernet and GigabitEthernet.

The manufacturing concept allows following configurations:

- 16, 32 or48 E1/T1
- 3 E3/T3 (DS3)
- 2 Giga Ethernet 1000BaseT
- 8 Fast Ethernet 10/100BaseT

Details on Tributary type and Capacity are show in following page.

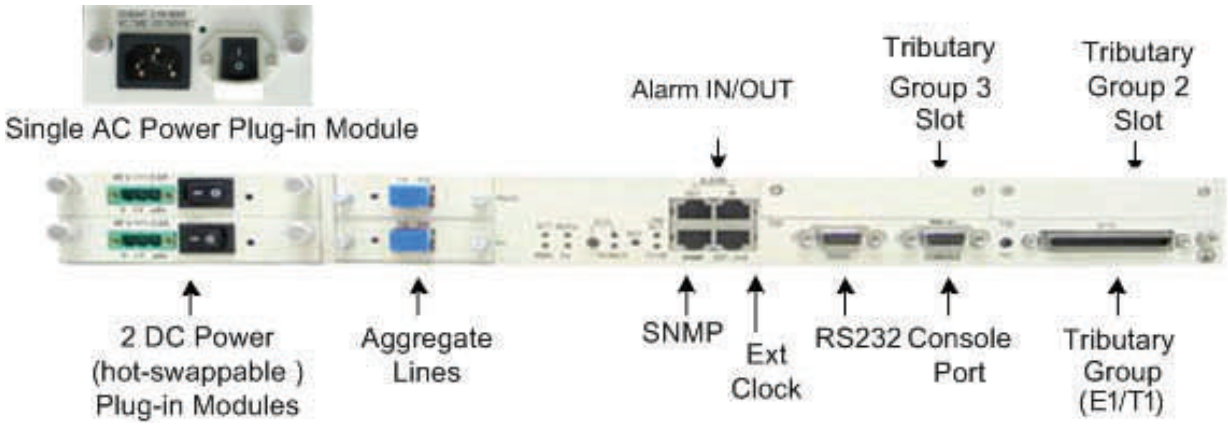
Element Management System – CXRView

The CXR-View EMS provides a user-friendly Element Management GUI Interface for user to configure CXR SDH products. With CXR-View EMS, the NE-level configuration can be done either locally through the Ethernet interface or remotely through the DCC channel.

Network Management System – CXR iNMS

The CXR-iNMS provides full-set FCAPS function support on both Loop Transmission SDH and CXR Access Products. With CXR-iNMS, network level management as well as OSS level North-bound interfaces are well supported. The powerful intelligence of CXR-iNMS enables several advanced features, such as end-to-end Circuit Management, Network Timing Synchronization, Circuit based Diagnostics, Performance Reports.

HX9400-S : TECHNICALS SPECIFICATIONS

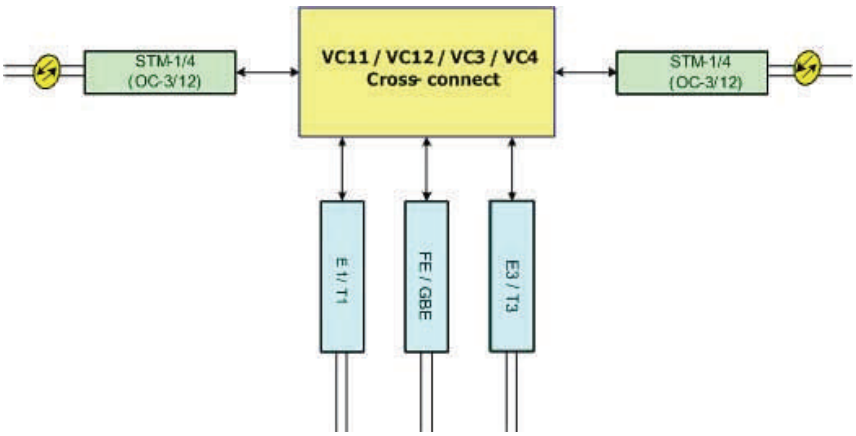


SDH Mux functionning

The HX9400-S is an SDH/SONET multiplexer with up to two aggregate STM –1/4 (OC-3/12) interfaces utilizing SFP modules. Only on rate is available by device (STM1 or STM4)

Operating modes

- ADM Add and Drop Multiplexer from East (STM1/4) to West (STM1/4)
- TM Terminal Multiplexer East or West (STM1/4)
- TM Terminal (1+1) East or West (STM1/4)
- 2 TM Terminal East or West (STM1/4)



SDH Supported Protection modes :

- ADM mode support ring protection RING SNCP(SDH) or UPRS (Sonet)
- TM mode with dual fiber support MSP(1+1)

SDH Cross-Connect :

The HX9400S is able to cross-connect VC11/VC12/VC3/VC4 with 2x4x63VC12 capacity

Number of tributaries

The HX9400-S is organized into 3 tributaries groups - TG1/2/3

The 1U chassis include 8 or 16 E1-120ohms and T1 or E1-75ohms (TG1)

Slots TG2 and TG3 may contain fixed modules 16E1, 3 E3/T3, Ethernet and Gigabit Ethernet.

We may have a maximum configuration with :

- 48 E1/T1 or
- 16E1/T1 + 6 E3/T3 or
- 16E1/T1+ 8 10/100BaseT or
- 16E1/T1+ 2 Gigabit Ethernet or
- 32E1/T1+ 3x10/100BaseT+1Gigabit Ethernet

Slot / Max. Capacity	Tributary Group1 (TG1)	Tributary Group2 (TG2)	Tributary Group3 (TG3)
48 E1/T1	16 E1/T1	16 E1/T1	16 E1/T1
6 E3/T3	N/A	3E3/T3	3E3/T3
2 GbE	N/A	1 GbE	1 GbE
8FE	N/A	4 FE	4 FE
1 GBE and 3 FE	N/A	N/A	1 GbE and 3 FE

AGREGATE INTERFACES — SFP MODULE

SFP modules are ordered separate from the HX941U shelf.

CXR suggest following SFP modules :

- SFP STM1/4 dual uni-directional fiber 1310 /1550nm with analog measurement
- SFP STM1/4 dual uni-directional fiber 1310 /1550nm with numeric measurement DDM (Digital Diagnostic Monitor)
- STM1 Electrical interface
- SFP STM1/4 module single fiber WDM 1310+1550nm (on demand)
- SFP-STM1/4 module Lambda CWDM (on demand)

SFP optical Module STM1 (155 Mbps)	Direction	Wavelength (nm)	Connector	Distance
SFP-STM1-SM2-LC	Dual uni-directional fiber	1310nm	LC	2 Km
SFP-STM1-SM30-LC	Dual uni-directional fiber	1310nm	LC	30 Km
SFP-STM1-SM50-LC	Dual uni-directional fiber	1310nm	LC	50 Km
SFP-STM1-SM100-15-LC	Dual uni-directional fiber	1550nm	LC	100 Km
SFP-STM1-SM120-15-LC	Dual uni-directional fiber	1550nm	LC	120 Km
SFP-STM1-SM30-DMM-LC	Dual uni-directional fiber	1310nm	LC (with DDM)	30 Km
SFP-STM1-SM50-DMM-LC	Dual uni-directional fiber	1310nm	LC (with DDM)	50 Km
SFP-STM1-SM100-DMM-15-LC	Dual uni-directional fiber	1550nm	LC (with DDM)	100 Km
SFP-STM1-SM120-DMM-15-LC	Dual uni-directional fiber	1550nm	LC (with DDM)	120 Km

SFP Modules STM1e (155Mbps)	Type	Connector	Distance
SFP-STM1-EC	Electric	2 Mini-BNC	100 m

SFP optical Module STM4 (622 Mbps)	Direction	Wavelength (nm)	Connector	Distance
SFP-STM4-SM20-LC	Dual uni-directional fiber	1310nm	LC	15-20 Km
SFP-STM4-SM40-LC	Dual uni-directional fiber	1310nm	LC	40 Km
SFP-STM4-SM50-LC	Dual uni-directional fiber	1310nm	LC	50 Km
SFP-STM4-SM80-15-LC	Dual uni-directional fiber	1550nm	LC	80 Km
SFP-STM1/4-SM10LC-DDM-LC	Dual uni-directional fiber	1310nm	LC (with DDM)	15 Km
SFP-STM4-SM20-DDM-LC	Dual uni-directional fiber	1310nm	LC (with DDM)	15-20 Km
SFP-STM4-SM40-DDM-LC	Dual uni-directional fiber	1310nm	LC (with DDM)	40 Km
SFP-STM4-SM50-DDM-LC	Dual uni-directional fiber	1310nm	LC (with DDM)	50 Km
SFP-STM4-SM80-15-DDM-LC	Dual uni-directional fiber	1310nm	LC (with DDM)	80 Km

HX9400S TRIBUTARY SPECIFICATIONS

TDM Interfaces

E1 Interface

Line rate	2.048 M bps ± 50 ppm	Output mask	ETS 300 689 Sec.4.2.1.2 ITU G.703
Line code	AMI/HDB3	Jitter	ITU G.823
Input signal	ITU G.703	Framing	Unframed
Output signal	ITU G.703	Impedance	75 ohms coax or 120 ohms RJ45
		Connector	One SCSI-II 68-pin

T1 Interface

Line rate	1.544 M bps ± 32 ppm	Output mask	Bellcore GR-499-core
Line code	AMI/B8ZS	Jitter	ITU G.824
Input signal	DSX-1 0dB to –6dB w/ALBO	Framing	Unframed
Output signal	DSX-1 w/short haul (0-133, 133-266,266-399, 399-533, 533-655 feet)	Impedance	100 ohms
		Connector	One SCSI-II 68-pin

E3 Interface

Line rate	34.368 M bps ± 20ppm	Output mask	ETS 300 689 Sec.4.2.1.2 ITU G.703
Line code	AMI/HDB3	Jitter	ITU G.823
Input signal	ITU G.703	Framing	Unframed
Output signal	ITU G.703	Impedance	BNC
		Connector	75 ohms coax

T3 Interface

Line rate	44.736 M bps ± 20ppm	Output mask	Bellcore GR-499-core
Line code	AMI/B3ZS	Jitter	ITU G.824
Input signal	ITU G.703	Framing	Unframed
Output signal	ITU G.703	Impedance	BNC
		Connector	75 ohms coax

RS232 Interface

Data rate	Asynchronous up to 19,2kbps	Connector DB9F	2 RS232 ports

Ethernet and Gigabit Ethernet Interfaces card

Fast Ethernet (FE) interface HX941U-4TTX in tributary group 2 or/and 3

Line rate	4 x 10/100Mbps	Mapping per FE	VC-4 or 3*VC-3 or 63*VC-12
Mode	E-Line	Connector	4 RJ45 ports
Process protocol	VCAT, GFP, LAPS, and LCAS		

Gigabit Ethernet (GBE) interface HX941U-GTX in tributary group 2 or/and 3

Line rate	1 x 1000Mbps	Mapping	4 x VC4, 12 x VC3 or x VC12
Mode	E-Line	Connector	RJ45
Process protocol	VCAT, GFP, LAPS, and LCAS		

Gigabit Ethernet (1 GBE) and Fast Ethernet (3 FE) interfaces with switch HX941U-SW1GTX-3TTX-6

Line rate	3 x 10/100Mbps and 1 x 10/100/1000Mbps	Mapping	1 WAN of maximum 622Mbps
	Mode E-Line or E-LAN	Connec-	4 RJ45 ports
Layer 2 Protocol	MSTP, RSTP, VLAN, IGMP		
	QoS		
Process protocol	VCAT, GFP, LAPS, and LCAS	or	BCP-PPP RFC2615

Gigabit Ethernet (1 GBE) and Fast Ethernet (3 FE) interfaces with switch HX941U-SW1GTX-3TTX-1

Line rate	3 x 10/100Mbps and 1 x 10/100/1000Mbps	Mapping	4 WAN of maximum 155Mbps
	Mode E-Line or E-LAN	Connec-	1 RJ45 ports
Layer 2 Protocol	MSTP, RSTP, VLAN, IGMP		
	QoS		
Process protocol	VCAT, GFP, LAPS, and LCAS	or	BCP-PPP RFC2615

HX9400S GENERALS SPECIFICATIONS

System Clock

Clock Source	Internal clock
	4 aggregate lines clocks (STM-1/4 (OC-3/12))
	6 tributary clocks
	2 external input and output clocks (2.048 MHz of ITU-T G.703 or E1 for STM-1/4, T1 for OC-3/12)

Management

LED	Multi colors
Console	Electrical: RS232, DCE
	Connector: DB9, female
	User interface: Menu driven VT-100
Telnet	VT100 menu type
SNMP	SNMPv1, RFC1213
OSS interface	10/100BaseT FE (IEEE 802.3u)
NE/NE interface	DCC/HDLC/PPP/Ethernet type II, In-band E1

Tests

Loopback Test	Local loopback, payload loopback, line loopback	
BERT Test	Optical interface	Direction: to optical lines

HX9400-S GENERALES SPECIFICATIONS

Performances monitor

Performance Reports	Performance Parameters: Error Block (EB), Background Block Error (BBE), Error Second (ES), Burst Error Second (BES), Severe Error Second (SES), Unavailable Second (UAS)			
Alarm History	System Alarm	Alarm Cut Off, Power Loss, TS Sync Loss, SNCP Switch, MSP Switch, Login/Logout, FOM Equip/Unequip, SFP Tx Fail, SFP Rx Fail, SFP Temperature		
	SDH/SONET Line Alarm	SDH	Line	PI-LOS, RS-LOF, RS-TIM, RS-BIP UAS, MS-SD, MS-SF, MS-AIS, MS-RDI, MS-BIP UAS, MS-REI UAS,
			Ho-Path	AU-LOP, AU-AIS, HP-SD, HP-SF, HP-TIM, HP-UNEQ, HP-PLM, HP-RDI-S, HP-RDI-C, HP-RDI-P, HP-BIP UAS, HP-REI UAS, LOM
			Lo-Path	TU-LOP, TU-AIS, LP-SD, LP-SF,
		SONET	Line	LOS-PI, LOF-S, TIM-S, BIP-S UAS, SD-L , SF-L , AIS-L , RDI-L , BIP-L UAS, REI-L UAS
			STS-Path	LOP-P, AIS-P, SD-P, SF-P, TIM-P, UNEQ-P, PLM-P, RDI-S-P, RDI-C-P, RDI-P-P, BIP-P UAS, REI-P UAS, LOM
			VT-Path	LOP-V, AIS-V, SD-V, SF-V
Alarm Queue	Contains up to 200 alarm records of latest alarm types, alarm severity, date and time.			

Power Supply

AC Module	90 to 240 Vac, 50/60Hz - 1 maximum
DC Module	-48 Vdc (-36 to -75V) - 2 module redundant maximum
Consummation	18.9 Watts

Physical and Environmental

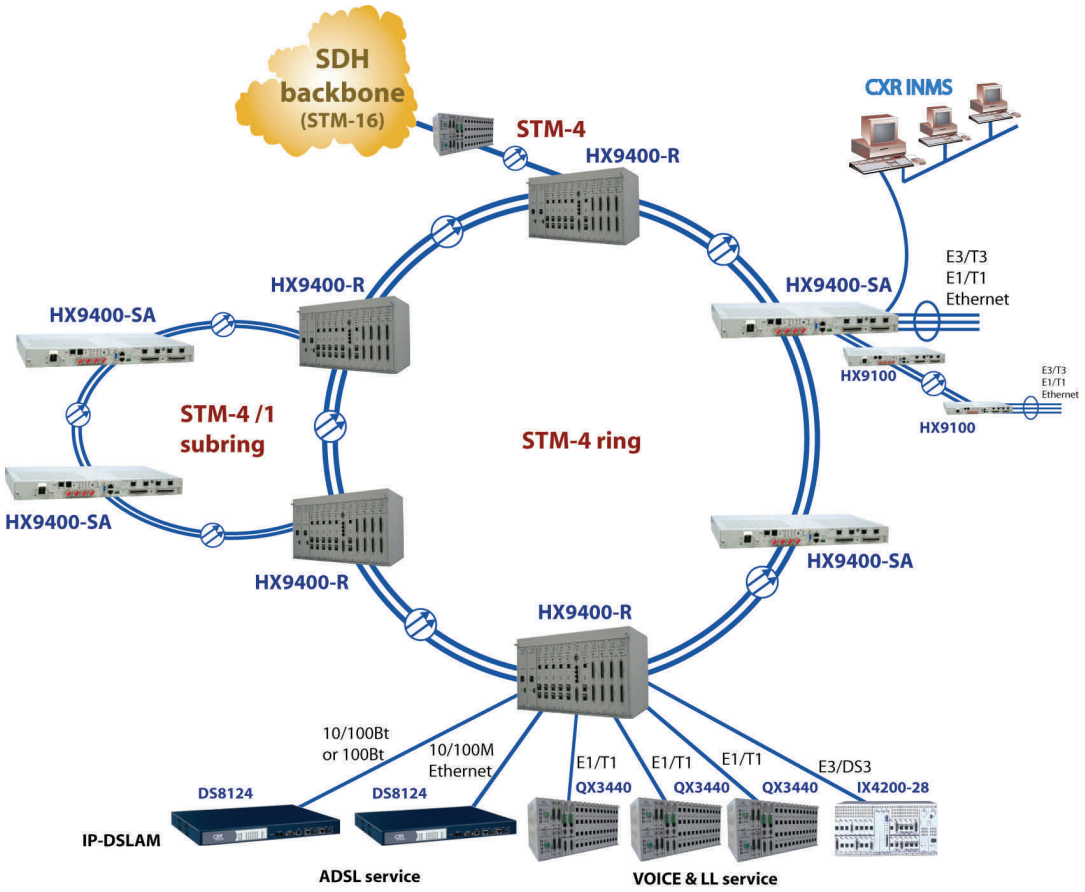
Dimensions 1u	(W x H x D) 432 x 44 x 240 mm / 17 x 1.7 x 9.5 “
Temperature	0 to 50°C / 32 to 122 °F
Humidity	0-95%RH (non-condensing)
Mounting	Table, rack 19’’ et 23’’ , Wall-mount

Standards compliance

ITU	G.664, G.707, G.7041, G.7042, G.775, G.783, G.806, G.823, G.747, X.86
ANSI	T1.105, T1.107
IEEE	802.1q (VLAN), 802.1w (RSTP), 802.1s (MSTP), 802.1ad (stack VLAN), 802.3x (flow control), 802.1p (QoS)

Certifications

EMC	EN55024
EMI	EN55022 Class A, FCC Part 15 Class A, EN55024
Safety	EN60950-1, IEC60950-1



HX9400-S REFERENCES DE COMMANDE

HX9400S-1U-8E1T1	Multiplexeur ADM STM1/STM4, 1U, SNMP, équipé de 16 E1 120ohms ou T1, cross-connect, 2 slots pour optique, slots alimentations, ajouter 1 ou 2 HX941U-STM4-SFP, IX-PAN-16E1-RJ45 et cable SCSI. Peux être complété de 2 Options à la commande dont maximum 1 switch Ethernet.
HX9400S-1U-8E1-75	Multiplexeur ADM STM1/STM4, 1U, SNMP, équipé de 16 E1 75ohms, cross-connect, 2 slots pour optique, slots alimentations.ajouter 1 ou 2 HX941U-STM4-SFP, IX-PAN-16E1-BNC et cable SCSI. Peux être complété de 2 Options à la commande dont maximum 1 switch Ethernet.
HX9400S-1U-16E1T1	Multiplexeur ADM STM1/STM4, 1U, SNMP, équipé de 16 E1 120ohms ou T1, cross-connect, 2 slots pour optique, slots alimentations, ajouter 1 ou 2 HX941U-STM4-SFP, IX-PAN-16E1-RJ45 et cable SCSI. Peux être complété de 2 Options à la commande dont maximum 1 switch Ethernet.
HX9400S-1U-16E1-75	Multiplexeur ADM STM1/STM4, 1U, SNMP, équipé de 16 E1 75ohms, cross-connect, 2 slots pour optique, slots alimentations.ajouter 1 ou 2 HX941U-STM4-SFP, IX-PAN-16E1-BNC et cable SCSI. Peux être complété de 2 Options à la commande dont maximum 1 switch Ethernet.
HX9400S-1U-VC4-8E1T1	Multiplexeur ADM STM1, 1U, SNMP, équipé de 16 E1 120ohms ou T1, cross-connect, 2 slots pour optique, slots alimentations, ajouter 1 ou 2 HX941U-STM4-SFP, IX-PAN-16E1-RJ45 et cable SCSI. Peux être complété de 2 Options à la commande dont maximum 1 switch Ethernet.
HX9400S-1U-VC4-16E1T1	Multiplexeur ADM STM1, 1U, SNMP, équipé de 16 E1 120ohms ou T1, cross-connect, 2 slots pour optique, slots alimentations, ajouter 1 ou 2 HX941U-STM4-SFP, IX-PAN-16E1-RJ45 et cable SCSI. Peux être complété de 2 Options à la commande dont maximum 1 switch Ethernet.
HX941U-STM4-SFP	Module pour optique SFP pour STM1 ou STM4, livré sans module SFP , minimum 1 maximum 2
HX941U-16E1T1	Option Usine doit être livrée avec le chassis HX9400S-1Uxx interface: 16E1 120ohms ou T1 100ohms, trib2 ou trib3, maxi 2 ,ajouter IX-PAN-16E1-RJ45 et cable SCSI
HX941U-16E1-75	Option Usine doit être livrée avec le chassis HX9400S-1Uxx interface: 16E1 75ohms, trib2 ou trib3, maxi 2 ,ajouter IX-PAN-16E1-BNC et cable SCSI
HX941U-E3T3	Option Usine doit être livrée avec le chassis HX9400S-1Uxx interface: 1 E3 ou DS3 75ohms pour HX9400-1U trib2 ou trib3, maxi 2
HX941U-1GTX	Option Usine doit être livrée avec le chassis HX9400S-1Uxx interface: 1 x 1000BaseT, sans switch, maxi 622Mbps, trib2 ou trib3, maxi 2
HX941U-4TTX	Option Usine doit être livrée avec le chassis HX9400S-1Uxx interface: 4 x 10/100BaseT, sans switch, 4 WAN de maxi 155Mbps, trib2 ou trib3, maxi 2
HX941U-SW1GTX-3TTX-1	Option Usine doit être livrée avec le chassis HX9400S-1Uxx interface: switch Niv 2 avec 1x1000BaseT + 3 10/100BaseT, maxi 4 conduit de 155Mbps, trib3 pas de carte dans trib2
HX941U-SW1GTX-3TTX-6	Option Usine doit être livrée avec le chassis HX9400S-1Uxx interface: switch Niv 2 avec 1x1000BaseT + 3 10/100BaseT, maxi 1 conduit de 622Mbp, trib3 pas de carte dans trib2
HX941U-SA	Alimentation 100/240V option pour HX9400-1U, maximum 1
HX941U-48	Alimentation 48V option pour HX9400-1U, maximum 2
HX9400S-MANUEL-F	Manuel d'utilisation du HX9400S en Français
HX9400S-MANUAL-E	Manuel d'utilisation du HX9400S en Anglais

	STM1 or STM4 modules
SFP-STM1/4-SM10-LC	SFP module STM1/STM4 single mode for 10km LC
SFP-STM4-SM20-LC	SFP module STM4 single mode for 20km LC
SFP-STM4-SM40-LC	SFP module STM4 single mode for 40km LC
SFP-STM4-SM50-LC	SFP module STM4 single mode for 50km LC
SFP-STM4-SM80-15-LC	SFP module STM4 single mode for 80km LC
SFP-STM1/4-SM10LC-DDM-LC	SFP module STM1/STM4 single mode for 10km LC, avec fonction DDM
SFP-STM4-SM20-DDM-LC	SFP module STM4 single mode for 20km LC, avec fonction DDM
SFP-STM4-SM40-DDM-LC	SFP module STM4 single mode for 40km LC, avec fonction DDM
SFP-STM4-SM50-DDM-LC	SFP module STM4 single mode for 50km LC, avec fonction DDM
SFP-STM4-SM80-15-DDM-LC	SFP module STM4 single mode for 80km LC, avec fonction DDM
SFP-STM1-SM2-LC	SFP module STM1 single mode 1310 for 2km, LC
SFP-STM1-SM30-LC	SFP module STM1 single mode 1310 for 30km, LC
SFP-STM1-SM50-LC	SFP module STM1 single mode 1310 for 50km, LC
SFP-STM1-SM100-15-LC	SFP module STM1 single mode 1550 for 100km, LC
SFP-STM1-SM120-15-LC	SFP module STM1 single mode 1550 for 120km, LC
SFP-STM1-SM30-DMM-LC	SFP module STM1 single mode 1310 for 30km, LC, with DMM
SFP-STM1-SM50-DMM-LC	SFP module STM1 single mode 1310 for 50km, LC, with DMM
SFP-STM1-SM100-DMM-15-LC	SFP module STM1 single mode 1550 for 100km, LC, with DMM
SFP-STM1-SM120-DMM-15-LC	SFP module STM1 single mode 1550 for 120km, LC, with DMM
	Accessories
IX-PAN-16E1T1-RJ45	19" pannel without SCSI cable and 16 E1/T1 RJ45 120ohms for HX9400
IX-PAN-16E1-BNC	19" pannel without SCSI cable and 16 E1 BNC 75ohms for HX9400
IX-PAN-16E1T1-WR	19" pannel without SCSI cable and 16 E1/T1 wire for HX9400
CA-SCSI-M-06	SCSI cable 60cm
CA-SCSI-M-2	SCSI cable 2 m
7055140114	Cable DB9M - DB9F 1,5m for console management

This document is not contractual. CXR AJ continuously improves its products. Specifications are subject to change without notice.

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